FACT SHEET FOR NPDES PERMIT NO. WA-002236-5

CITY OF OKANOGAN PUBLICLY-OWNED TREATMENT WORKS

SUMMARY

The City of Okanogan is seeking reissuance of its National Pollutant Discharge Elimination System (NPDES) Permit for its Publicly-Owned Treatment Works (POTW). The POTW consists of approximately 17 miles of sewers, three lift stations, and a wastewater treatment plant. The treatment plant provides secondary-level treatment utilizing an activated sludge process and ultraviolet (UV) disinfection, and then discharges treated wastewater through a submerged outfall to the Okanogan River. The City completed a major upgrade of the treatment plant in July 2002.

The previous permit was issued in September 1999. During the period from permit issuance to completion of the treatment plant upgrade, the City encountered problems complying with the effluent limits, especially Fecal Coliform Bacteria. Since completion of the upgrade and installation of the UV system, the City's record of compliance has been excellent.

This permit contains several modifications from the previous permit. The changes were largely driven by the Department of Ecology's (Department's) Total Maximum Daily Load (TMDL) Study to address non-attainment of water quality standards for DDT and PCB in the Okanogan River. As part of the TMDL Study, DDT was found in the treatment plant sludge and effluent, and PCB was found in the sludge. However, from a regulatory perspective, the presence of DDT and PCB presents a difficult challenge because both of these highly toxic substances have been banned since the 1970s. DDT was used extensively for pest control on the area agricultural lands and forests from the mid-1940s to the early-1970s. In the opinion of the Department, the most desirable solution is to identify the source of these pollutants reduce and, if possible eliminate them from the POTW. For these reasons, in lieu of numerical effluent limits, this permit requires the City to conduct a study to identify, reduce and, if possible, eliminate DDT and PCB from the POTW.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the State is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Okanogan
Facility Name and Address	City of Okanogan Wastewater Treatment Plant 1610 1st Avenue S. Okanogan, WA 98840
Type of Treatment	Rotating Biological Contactor with Ultraviolet (UV) Disinfection
Discharge Location	Okanogan River, River Mile 24.8 Latitude: 48° 21' 10" N Longitude: 119° 35' 39" W
Water Body ID Number	WA-49-1010 (Old) YN58LL (New)

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

History

The City of Okanogan Wastewater Treatment Plant was originally constructed and placed into operation in 1948 as a trickling filter secondary treatment facility with an average design flow of 0.25 mgd. During 1983-84, the facility was upgraded. The upgrade replaced the trickling filter with a two-stage RBC system, which increased the design flow to 0.54 mgd. Additionally, the collection system was largely replaced in conjunction with the plant upgrade and is thought to be notably free of infiltration. An NPDES permit was first issued in November 1980, and was renewed in June 1985 and May 1994. The present estimated population served by the facility is approximately 2,460.

During the previous permit cycle the treatment plant underwent an upgrade. The primary motivation of the work was to address the lack of redundancy in the biological treatment process. Although the upgrade may have resulted in an increase in treatment capacity, revision of the treatment plant's design criteria has not been formally proposed by the City or approved by the Department.

The main elements of the upgrade were:

- construction of a new influent lift station,
- installation of two additional RBC units (for a post-upgrade total of four) and enhanced ancillary blower capacity, and,
- installation of a UV disinfection system.

Collection System Status

The City of Okanogan collection system is composed of approximately 16.68 miles of sewers and three lift stations.

Treatment Processes

The facility uses a rotating biological contactor (RBC) process which provides secondary treatment for the City of Okanogan. Effluent is continuously discharged to the Okanogan River.

The typical wastewater flow path, although considerable flexibility exists, is that influent enters the facility at the influent wet well and is pumped through a prerotational centrifugal pumping system to a diversion box. The prerotational system automatically matches the influent flow without variable speed drives, instead using a liquid level sensor. Flows from the diversion box can be sent to either one of two Muffin Monster grinders or a bypass bar screen. Wastewater is then treated in an aerated grit chamber. Grit is processed in a cyclone classifier and then landfilled.

After treatment in the grit chamber, flows enter another diversion box and are then piped to the primary clarifier, where the larger organic solids are allowed to settle out. Clarifier effluent is then routed to the RBC treatment process. The facility has a total of four RBC units arranged in two treatment trains of two units each. After biological treatment, wastewater undergoes clarification in one of two secondary clarifiers. Following clarification, effluent is disinfected utilizing the new UV system. The UV system is a low-pressure, low-intensity process.

Settled primary clarifier sludge is pumped to the aerobic digesters for digestion. Settled secondary clarifier sludge is pumped to the headworks.

Discharge Outfall

Secondary treated and disinfected effluent is discharged from the facility into the Okanogan River at approximately River Mile 24.8. The City of Okanogan Wastewater Treatment Plant discharges effluent via an 18-inch diameter outfall pipe with no attached diffuser. The outfall is located approximately 20 feet offshore and submerged approximately 15 feet beneath the surface of the Okanogan River.

Compliance Sampling and Flow Monitoring

The treatment plant has installed two 24-hour composite samplers and a flow meter to verify compliance with the permit. The influent sampler is located before the influent lift station and monitors organic loadings to the treatment plant. The effluent sampler and the ultrasonic flow meter are located after the UV disinfection process.

Residual Solids

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill.

Sludge is treated utilizing aerobic digestion and drying beds, and land applied under a permit from the Okanogan Health District. The City is currently in compliance with requirements of the State's Biosolids Program.

PERMIT STATUS

The previous permit for this facility was issued on July 9, 1999. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, Fecal Coliform Bacteria, and Total Residual Chlorine.

An application for permit renewal was received by the Department on April 30, 2003 and accepted by the Department on May 19, 2003.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

A compliance inspection without sampling was conducted on May 16, 2003. The inspection revealed the treatment plant to be well-operated and well-maintained.

Until completion of the treatment plant upgrade in July 2002, the Permittee frequently had compliance problems with the Fecal Coliform effluent limits and less frequently with the BOD limits, based on Discharge Monitoring Reports (DMRs) submitted to the Department. Since completion of the upgrade the facility's record of compliance has been excellent.

WASTEWATER CHARACTERIZATION

Influent and effluent characterization data were reported in DMRs submitted to the Department and are summarized in this section for the period from August 2002, when the upgraded treatment plant became operational, through May 2003.

Influent

BOD and TSS Loadings

BOD and TSS loadings to the treatment plant are summarized in Table 1. Monthly influent loading data are presented in comparison to design loadings.

Table 1: Characterization of Influent Loadings

Parameter	Ten-month Average	Highest Monthly Loading	Percent of Monthly Design Loading	Maximum Monthly Design Loading
BOD_5	354 lbs/day	557 lbs/day	55.3%	1,007 lbs/day
TSS	294 lbs/day	382 lbs/day	36.1%	1,057 lbs/day

Effluent

Conventional Pollutants

Average monthly effluent concentrations for the conventional pollutants are summarized in Table 2 and compared to their respective effluent limits in the previous permit.

Table 2: Characterization of Effluent

Parameter	10-month Average	Highest Monthly Average	Monthly Permit Limits
BOD_5, in mg/L	6.20	11	30
TSS, in mg/L	8.70	13	30
Fecal Coliform Bacteria, in #colonies/100 mL	11	18	200

BOD and TSS concentrations are often at or below 10 mg/L and removal rates for these constituents are generally about 95 percent, greatly exceeding the secondary-level treatment performance standards.

Ammonia and Total Residual Chlorine

The previous permit did not contain effluent limits for Ammonia because there was no reasonable potential for Ammonia in the discharge to exceed the water quality standards. Since the upgraded treatment plant became operational, effluent Ammonia concentrations are generally

at or below 1 mg/L, although the City reported a level of 4.73 mg/L for a sample taken in November 2002.

The previous permit contained average monthly and maximum daily limits for Total Residual Chlorine. However, the UV disinfection system became operation in the Summer of 2002 and the gas chlorination system has been physically removed from the treatment plant. Therefore, Residual Chlorine effluent concentrations are not characterized in this fact sheet.

Priority Pollutants

A municipal wastewater treatment plant with a design flow under 1 MGD is generally not required to characterize its discharge for priority pollutants, unless it receives a discharge from a significant industrial user, or under other special circumstances. However, as part of the Department's Total Maximum Daily Load (TMDL) Study to address exceedances of the DDT and PCB criteria in the Okanogan River, the Permittee's effluent and sludge were sampled for these pollutants in 2001 and 2002. DDT and its metabolites were found in two effluent samples and one sludge sample. In addition, PCB and its metabolites were found in the effluent and sludge. The presence of these pollutants at the treatment plant, and their influence on the requirements of this permit, are discussed in the section of this fact sheet titled **Consideration of Surface Water Quality-Based Limits for Numeric Criteria**: Toxic Pollutants.

SEPA COMPLIANCE

The recent treatment plant upgrade underwent environmental review through both the State Environmental Policy Act (SEPA) and State Environmental Review Process (SERP). Review through the SEPA satisfies State requirements while the SERP process is established to comply with Federal requirements, when Federal loans or grants are involved.

The requirements of SEPA were fulfilled with the issuance of a Determination of Non-Significance (DNS) by the City on April 30, 1999. In addition, a SERP checklist was prepared for the project, dated May 7, 1999. Copies of the SEPA and SERP checklists may be found in the 1999 Engineering Report, as Appendices C and D, respectively.

PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be

chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the approved City of Okanogan Wastewater Treatment Facility Improvements Engineering Report, prepared by Gray & Osborne and dated May 1999, and are as follows:

Table 3: Design Criteria for the City of Okanogan WWTP

Parameter	Design Quantity
Monthly average flow (max. month)	0.54 MGD
BOD_5 influent loading	1,007 lbs/day
TSS influent loading	1,057 lbs/day
Design population equivalent	3,755 people

The City's consultants are currently developing a new Facility Plan, which may incorporate revised design criteria; however, because present loadings to the treatment plant are far below the current design criteria, this permit contains only the current criteria in Special Condition S4.A. The facility's design criteria will be reevaluated at the next permit renewal.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by Federal and State regulations. These effluent

limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (Federal) and in Chapter 173-221 WAC (State). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, Fecal Coliform Bacteria, BOD_5, and TSS are taken from Chapter 173-221 WAC are:

Table 4: Technology-based Limits

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD_5 (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The following technology-based BOD and TSS mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow (0.54 MGD) x Concentration limit (30 mg/L) x conversion factor (8.34) = 135.1 lbs/day.

The weekly average mass loading limits were calculated as 1.5 x monthly loading = 202.7 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a State regulation designed to protect the beneficial uses of the surface waters of the State. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The State was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in this permit. The discharges authorized by this permit should not cause a loss of beneficial uses.

Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

Mixing Zones

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

Description of the Receiving Water

The facility discharges to the Okanogan River, which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls to the river include the City of Omak's wastewater treatment plant's outfall, approximately 4 miles upstream, and discharges from several fruit packing facilities in the Okanogan-Omak area. Significant nearby non-point sources of pollutants include unquantified storm water discharges from urban and agricultural areas. Characteristic uses include the following:

> water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

This segment of the river is designated WA-49-1010 using the Department's old Waterbody Identification system and YN58LL using the new system. According to the Department's most recent (1998), approved 303(d) list of impaired waterbodies, this segment of the river is listed for the following parameters: Temperature, Fecal Coliform Bacteria, 4,4' DDD, 4,4' DDE, PCB-1254 and PCB 1260. The listings for Temperature and Fecal Coliform Bacteria are based on exceedances of the water quality criteria in the water column; the listings for DDT, PCB and their metabolites are based on exceedances of the human health criteria found through fish tissue

analysis. At this time, TMDL Studies for Temperature and Fecal Coliform Bacteria have not been scheduled. TMDL Studies for DDT, PCB and their metabolites are in progress.

Both DDT and PCB are environmentally pervasive, fat soluble and bioaccumulate in fish tissue. DDT was banned by the US EPA in 1972 for all uses except emergencies. PCBs were banned by US EPA in 1979 due to concerns about human carcinogenicity. PCBs were used as heat transfer fluids, wax and pesticide extenders, plasticizers and several other applications.

The mainstem Okanogan River is 303(d)-listed for DDT and PCBs based on fish bioassays conducted in the mid-1990's. However, the 303(d) DDT listings for three tributaries to the river are based on exceedances of the water quality criteria in the water column.

The Draft TMDL Report addressing DDT and PCB found that tributaries and sewage treatment plants contribute only about 200 mg/day of total DDTs (t-DDT) and 1 mg/day t-PCB to the mainstem Okanogan River, compared to measured DDT loads of 1,500 - 4,300 mg/day and no measurable PCBs on the lower river (Abstract, p.3). The Draft TMDL Report suggests that the Okanogan River continues to be dosed with contaminated Osoyoos Lake sediments which are re-suspended and transported downstream during high flow episodes (p. 48). The source of PCBs is more problematic, and due to the difficulty in detecting them in the water column, no serious efforts were made by the investigators to determine the sources of this contaminant (p. 38). See the Toxic Pollutants section of this fact sheet for further information on the DDT and PCB studies.

Surface Water Quality Criteria

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Table 5: Applicable Water Quality Criteria

Parameter	Criteria
Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 Standard Units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts

Consideration of Surface Water Quality-Based Limits for Numeric Criteria

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls, which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The recent upgrade to the treatment plant did not result in an increase in the design flow volume of 0.54 MGD; therefore, the dilution factors in this permit are retained from the previous permit.

Table 6: Dilution Factors

	Acute Dilution Factor	Chronic Dilution Factor
Aquatic Life	11.1	101.6

At this time, the City is developing a new Facility Plan. In the event the plan is completed and approved by the Department, the above dilution factors may be revised, probably at the next permit renewal.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants -- their adverse effects diminish rapidly with mixing in a receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs at some distance away from the discharge, even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which a pollutant of concern has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the ambient receiving water.

The critical condition for the Okanogan River is the seven-day average low river flow with a recurrence interval of ten years (7Q10). Sources of ambient background critical condition data information from the Permittee (7Q10 stream width and depth and outfall characteristics), the Department's Environmental Assessment Program (7Q10 flow volume and water quality data), and the U. S. Geological Survey (7Q10 stream velocity). Ambient water quality data used in the reasonable potential analysis reflect monthly grab sampling during critical (hot weather) conditions in the months of July, August and September of the years 1999 through 2002. These months were selected because water temperatures are at their highest and DO levels are at their lowest. Furthermore, because the water quality criteria for Ammonia are partially Temperature-dependent (along with pH), the calculated Ammonia criteria are their most stringent.

Table 7: Ambient Data Used for Reasonable Potential Analysis

Parameter	Value
7Q10 low flow	372 cfs
Velocity	1.5 ft/sec
Depth	13 feet
Width	100 feet
Temperature (90th percentile)	23.85°C
pH (90th percentile)	8.4
Dissolved Oxygen (10th percentile)	7.9 mg/L

The impacts of Dissolved Oxygen deficiency, Temperature, pH, Fecal Coliform Bacteria, and Ammonia were determined as shown below, using the dilution factors at critical conditions described above.

BOD_5--The Permittee's facility consistently discharges high quality effluent that results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. In the best professional judgment of the Department, technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition was 23.85^{o}C and the effluent temperature was 23.97 ^{o}C. Both Temperatures are the 90th percentile values of seasonal data. The chronic dilution factor used in the analysis was 101.6. The predicted resultant Temperature at the boundary of the chronic mixing zone is 23.85^{o}C; there was no predicted incremental increase.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in this permit.

pH--During the effluent characterization period (August 2002 through May 2003), the minimum was 6.53 and the maximum reported pH was 8.48. These values comply with the water quality criteria of 6.5 to 8.5 without the benefit of dilution. Therefore, under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters and the technology-based effluent limitations for pH was placed in the permit.

Fecal coliform--The numbers of Fecal Coliform were modeled by simple mixing analysis using the technology-based limit of 200 organisms/100 mL and a dilution factor of 101.6. The highest geometric mean concentration reported to the Department during the characterization was 18 organisms/100 mL. Therefore, under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters and the technology-based effluent limitation for Fecal Coliform Bacteria was placed in this permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: Ammonia, DDT, PCB and their metabolites. A reasonable potential analysis (See Appendix C) was conducted on Ammonia to determine whether or not effluent limitations would be required in this permit.

The treatment plant's discharge and sludge were sampled for DDT, PCB and their metabolites as part of the TMDL efforts to address non-attainment of water quality standards. DDT, PCB and their metabolites are addressed together in this fact sheet and the permit because they are addressed jointly in the Department's multi-parameter TMDL Study.

Ammonia

The determination of the reasonable potential for Ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during the warm weather months (July through September) when Ammonia is most toxic. The parameters used to determine the Ammonia criteria, and the resulting criteria, are contained in Table 7 and the Department's standard spreadsheet. The resulting criteria were:

Table 8: Ammonia Criteria

Acute Criterion	Chronic Criterion
1.8 mg/L	0.30 mg/L

After calculating the Ammonia water quality criteria, a reasonable potential analysis was conducted on the Department's standard spreadsheet to determine the likelihood of the discharge to exceed the criteria. The reasonable potential analysis was very conservative in that the highest single reported effluent Ammonia concentration of 4.73 mg/L was used, rather than the 90th percentile value of approximately 2.4 mg/L. The analysis showed no reasonable potential; therefore, this permit does not contain an Ammonia effluent limit.

DDT, PCB and their Metabolites

DDT and its metabolites were detected in the City's effluent in 2 samples taken in April and May of 2001. PCB was not detected in the effluent samples. Both DDT and PCB metabolites were found in the treatment plant sludge. The following effluent data were excerpted from Table 11 of the draft TMDL Report. The May 2002 sample was analyzed for PCBs only. Data are reported in nanograms per liter (ng/L).

Table 9: DDT and PCB Effluent Characterization

Date	4,4'-DDE, in ng/L	4,4'-DDD, in ng/L	4,4'-DDT, in ng/L	t-DDT, in ng/L	PCBs, in ng/L
4/17/01	0.7	u(0.8)	0.6	1.3	nd
5/16/01	0.4	0.4	1	1.8	nd
5/14/02	na	na	na	na	0.39
u-undetected at practical quantitation limit in parenthesis.					
nd-not detected, no practical quantitation limit determined.					
na-not applicable					

The report notes that daily effluent loads of DDT and PCBs were low at all three treatment plants (Oroville, Omak and Okanogan). The Okanogan facility had daily loads similar to the lowest measured loads in the tributary streams.

PCBs were found to be present in treatment plant sludges at substantial concentrations. Since PCBs were difficult to detect in water, investigators estimated daily loads of PCBs discharged from the facility based on the concentrations of suspended solids in the effluent. They assumed the suspended solids in the effluent were composed primarily of sludge (TMDL Draft Report, pp. 34-35).

Estimated DDT and PCB daily loads discharged from the Okanogan treatment plant to the Okanogan River, based on effluent samples (DDT) and sludge samples (PCBs) are presented in Table 10.

Table 10: Estimated Daily Loads of DDT and PCB from the Okanogan STP

4,4'-DDE, in mg/day	4,4'-DDD, in mg/day	4,4'-DDT, in mg/day	t-DDT, in mg/day	t-PCB[a], in mg/day
0.8	0.3	1.1	2.2	1.3

a-Results shown are for PCB Aroclors 1260, 1254, 1248, 1242, 1232, 1221 and 1016.

In the best professional judgment of the Department, establishment of effluent limits for DDT, PCB and their metabolites are not appropriate at this time, for several reasons. First, the TMDL Report is still in draft form. The issuance date for the final report has not been determined and it must be reviewed and approved by US EPA. Second, its difficult to establish effluent limits based on the two effluent samples that have been taken up until this time, because it is not known whether these sample results are representative. The Department generally considers six to eight samples to be the minimum for statistical validity. Third, DDT has been largely banned in this country since 1972 and PCB since 1979, and the Department feels it is not appropriate to establish effluent limits for these illegal substances. The Department feels the most desirable outcome for this situation is to identify, reduce and, if possible eliminate them from the POTW.

Therefore, this permit establishes a Schedule of Compliance to address this problem. The Schedule of Compliance is described and discussed later in its own section of this fact sheet .

Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to contain the toxic chemicals DDT, PCB and their metabolites. This permit would ordinarily contain requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. However, the Permittee is improving pollution control in order to meet other regulatory requirements. The results of an effluent characterization for toxicity would not be accurate until after the improvements have been completed.

WAC 173-205-030(4) allows the Department to delay effluent characterization for WET for existing facilities that are under a compliance schedule in a permit to implement technology-based controls or to achieve compliance with surface water quality-based effluent limits.

The study to determine the source(s) of DDT and PCB to the POTW, and their reduction, is expected to take the entire upcoming permit cycle; therefore, the need for WET Testing will be reevaluated at the next permit renewal.

Human Health

Washington’s water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the State by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent contains chemicals of concern for human health. The discharger's high priority status is based on knowledge that the applicant discharges to a waterbody that is 303(d) listed for regulated chemicals, and that the chemicals are present in the effluent. The chemicals of concern are DDT, PCB and their metabolites.

Special Condition S8 of this permit is a Schedule of Compliance, which requires the City to conduct a study to determine the source(s) of DDT and PCB, their reduction and, if possible, their elimination from the POTW. The study is expected to take the entire upcoming permit

cycle; therefore, the potential human health impacts of the City's discharge will be reevaluated at the next permit renewal.

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

SCHEDULE OF COMPLIANCE

As has been stated earlier in this fact sheet, low concentrations of DDT, PCB and their metabolites have been found in the treatment plant sludge and effluent as a result of sampling undertaken as part of the TMDL Study. The Department has determined that it would be inappropriate at this time to establish numerical effluent limits for these pollutants. See the section of this fact sheet **Consideration of Surface Water Quality-Based Limits for Numeric Criteria,** *DDT, PCB and their Metabolites* for the discussion of this determination.

The Schedule of Compliance requires the completion of a study to determine the source of DDT, PCB and their metabolites that have been found in the treatment plant's effluent. The goals of the study are to identify the source of the pollutants, their entry point into the POTW, and to develop measures to reduce these substances from the POTW.

The Schedule of Compliance is intended to be fulfilled by the end of this permit cycle. The City is required to submit a Scope of Work, which describes the strategy and methodology of the study, followed by twice-per-year progress reports. The final report of the study is due with the next application for permit renewal.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE PREVIOUS PERMIT

The effluent limits in this permit are nearly identical to those contained in the previous permit, with the exception of the removal of the Residual Chlorine limit, due to the discontinued use of the chlorine disinfection system.

Parameter	**Existing Permit Limits**		**Proposed Permit Limits**	
	Monthly Average	**Weekly Average**	**Monthly Average**	**Weekly Average**
BOD	30 mg/L 85 % removal 135.1 lbs/day	45 mg/L 202.7 lbs/day	30 mg/L 85 % removal 135.1 lbs/day	45 mg/L 202.7 lbs/day
TSS	30 mg/L 85 % removal 135.1 lbs/day	45 mg/L 202.7 lbs/day	30 mg/L 85 % removal 135.1 lbs/day	45 mg/L 202.7 lbs/day
Fecal Coliform	200/100 mL	400/100 mL	200/100 mL	400/100 mL
pH	6 to 9 standard units		6 to 9 standard units	
Parameter	**Daily Maximum**		**Monthly Average**	**Daily Maximum**
Chlorine	0.21 mg/L		Not Applicable	

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

The monitoring schedule is largely unchanged from the previous permit, with a few minor revisions. Testing for Residual Chlorine has been dropped because this chemical has not been utilized at the facility since the UV disinfection system was installed.

This permit requires the City to undertake a study to identify, reduce and, if possible, eliminate DDT and PCB from the POTW. This permit does not specify a monitoring program for this effort. Rather, the City is required to propose a monitoring program as part of the study's scope of work, to be submitted early in the permit cycle.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for BOD, TSS, DO, pH and Fecal Coliform Bacteria.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The provisions of Special Condition S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in Special Condition S4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Special Condition S4. restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

This permit contains Special Condition S5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

This permit requires submittal of one I&I Evaluation and one Wasteload Assessment during the permit cycle. The Department will use the I&I Evaluation during development of the next

permit to determine whether I&I in the collection system has changed since the previous evaluation. Similarly, the Wasteload Assessment will be used to quantify the change in loadings to the treatment plant since the previous assessment was conducted. The information generated by these assessments will be used in development of the next permit.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in Special Condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Okanogan County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department delegates to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8(f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and certain other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)). (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit

at least sixty days prior to commencing discharge. The conditions contained in the permits include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system". Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State Waste Discharge Permit application.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet..

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition, wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in

significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

GENERAL CONDITIONS

General Conditions are based directly on State and Federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended State or Federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five (5) years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html

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1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A -- PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 16, 2003 in the Wenatchee World to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on September 10, 2003 in the Omak-Okanogan County Chronicle to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105, or by writing to the address listed above.

This fact sheet and the proposed permit were written by Jim LaSpina.

APPENDIX B -- GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the Federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD5 – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD5 is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the-State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C -- TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at (http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Calculation Of Ammonia Criteria

Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT	
1. Ambient Temperature (deg C; 0<T<30)	23.9
2. Ambient pH (6.5<pH<9.0)	8.40
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15

OUTPUT	
1. Intermediate Calculations:	
Acute FT	1.00
Chronic FT	1.41
FPH	1.00
RATIO	14
pKa	9.28
Fraction Of Total Ammonia Present As Un-ionized	11.6405%
2. Un-ionized Ammonia Criteria	
Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L)	260.0
Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L)	42.0
3. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (mg NH3+ NH4/L)	2.2
Chronic Total Ammonia Criterion (mg NH3+ NH4/L)	0.4
4. Total Ammonia Criteria expressed as Nitrogen:	
Acute Ammonia Criterion as mg N	1.8
Chronic Ammonia Criterion as N	0.30

REASONABLE POTENTIAL CALCULATION

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H

CALCULATIONS

	State Water Quality Standard		Max concentration at edge of...												
	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	**LIMIT REQ'D?**	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
Ammonia	1800	300	472.18	51.59	NO	0.95	0.928	4730	0.60	0.55	40	1.11	11.1	101.6

APPENDIX D -- RESPONSE TO COMMENTS

No comments were received by the Department of Ecology.